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PROBLEMS FOR SOLUTION.

ARITHMETIC.

90. Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

Find the greatest number of inch balls that can be placed in a box 10 inches square and 5 inches deep.

91. Proposed by RAYMOND D. SMITH, Tiffin, Ohio.

A barn 20 feet square is standing in a pasture, and a horse is tied to one corner of it with a rope 50 feet long. Over how much land can he graze ?

92. Proposed by J. A. CALDERHEAD, M. Sc., Professor of Mathematics in Curry University, Pittsburg, Pa.

What rate of income do I realize by purchasing United States 4% bonds at 105 if I sell them in six years at 104 ?

⁂ Solutions of these problems should be sent to B. F. Finkel, not later than April 10.

GEOMETRY.

88. Proposed by FREDERICK R. HONEY, Ph. B., Instructor in Mathematics in Trinity College, New Haven, Conn.

Prove that the volume of the frustum of a cone is equal to one-sixth of the altitude multiplied by the sum of the areas of the upper base, the lower base, and four times the area of the section midway between the upper and lower bases.

89. Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

Describe a circle tangent to three given circles. [From *Chauvenett's Geometry*, page 318, ex. 213.]

90. Proposed by G. B. M. ZERR, A. M., Ph. D., President and Professor of Mathematics in Russell College, Lebanon, Va.

The bisectors of the angles of the opposite sides (produced) of an inscribed quadrilateral cut the sides at the angular points of a rhombus.

⁂ Solutions of these problems should be sent to B. F. Finkel, not later than April 10.

CALCULUS.

70. Proposed by J. OWEN MAHONEY, B. E., M. Sc., Graduate Fellow in Mathematics in Vanderbilt University, P. O., Lynnville, Tenn.

Prove $\displaystyle\int_0^\infty \frac{\cos ax}{1+x^{2n}}dx = -i\frac{\pi}{n}\sum_{r=1}^{n} \omega^{2r-1}e^{ai\omega^{2r-1}}$

where n is an integer, a is positive, and ω is $e^{i\pi/2n}$.

Is this correct ? Forsyth gives, on page 41, of his *Theory of Functions*, the integral

$$\int_{-\infty}^{\infty} \frac{\cos ax\,dx}{1+x^{2n}} = -i\frac{\pi}{2l}\sum_{r=1}^{n} \omega^{2r-1}e^{ai\omega^{2r-1}}.$$